

Establishing Goals for the Biobased Industry in Wisconsin

The draft agenda for the October 17 meeting of the Consortium on Biobased Industry sets aside time to begin consideration of Wisconsin's goals for its biobased industry. This is a background piece intended to facilitate that discussion. The actual goal recommendations will be made after the Consortium has had an opportunity to review the Opportunities and Advantages study by the Energy Center of Wisconsin (ECW) and the Center on Wisconsin Strategy (COWS). At this point, staff and others need guidance on the topical areas and format that the Consortium wishes to use for the goals they establish. This guidance will allow data to be developed in a manner consistent with the wishes of the Consortium.

Goals

Cheshire Puss, she began, Would you tell me, please, which way I ought to go from here?

That depends a good deal on where you want to get to, said the Cat.

I don't much care where-- said Alice.

Then it doesn't matter which way you go, said the Cat.

--so long as I get SOMEWHERE, Alice added as an explanation.

Oh, you're sure to do that, said the Cat, if you only walk long enough.

Alice in Wonderland

So, we need to figure out quite specifically "where we want to get to."

Values

A necessary assumption is that the goals will conform to the values that the Consortium will use to evaluate its recommendations. It continues to be our expectation that the Consortium will evaluate recommendations based on a screen of its own experience and knowledge as well as the values that are important to the residents of Wisconsin. This means that those values must be clearly understood. In an attempt to enumerate them, we have drawn on statements of Governor Doyle and his top aides and other long established state-wide values.

In creating the Consortium, the Governor made clear his intention that the Consortium was directed toward "renewable farm and forest resources" in order to strengthen the agriculture and forestry sectors of the Wisconsin economy. He was also clear on his expectation that air and water quality, as well as the environment in general, be improved as a result of the work of the Consortium. The Governor, as well as the consortium itself in various statements, has made clear its intent to establish Wisconsin as a leader in the field of biobased industry. Reflecting long standing public values in Wisconsin, the Governor also expects that Consortium recommendations will contribute to the rural quality of life, primarily through increased employment and business opportunities. This quality of life also includes the retention of local

ownership of a large portion of any new biobased industrial investment, rather than corporate control exercised from outside of the state. This is a summary enumeration of the values to be observed:

- Strengthen ag sector
- Strengthen forestry sector
- Preserve local ownership
- Protect the environment
- Improve Air quality
- Improve water quality
- Minimize net greenhouse gas emissions
- Decrease erosion and control flooding
- Improve rural quality of life
- Establish Wisconsin leadership

The Consortium will want to consider if this list is complete.

Starting Point

In 2002, the U.S. Department of Energy issued the “Vision for Bioenergy and Biobased Products in the United States.” The Vision represented the efforts of the Biomass Technical Advisory Committee created by the Biomass R&D Act of 2000. It established goals for the United States that would “dramatically transform the role of biomass in the everyday lives of Americans.” These goals were expressed in term of market share of national demand for biopower, biofuels and byproducts.

Table 1
U.S. Department of Energy
Goals for Bioenergy and BioProducts

	2010	2020	2030
BioPower Biomass share of electricity & heat demand in utilities and industry	4% 3.3 Quads	5% 4.0 Quads	5% 5.0 Quads
BioFuels Biomass share of demand for transportation fuels	4% 1.3 Quads	10% 4.0 Quads	20% 9.5 Quads
BioProducts Share of target chemicals that are biobased	12%	18%	25%

A quad represents 1.0 quadrillion BTUs

Wisconsin Goals

These goals, which embrace the whole of the biobased industry and extend 25 years into the future, provide a template that can be adapted to individual state purposes. It should be noted that these DOE goals differ substantially from projections prepared by the Energy Information Agency. EIA forecasts do not assume significant policy changes and are calculated from an assumption of much less expensive oil. These differences will have to be reconciled prior to the establishment of any numeric goal. Still, state adaptation of this basic format has the advantage of maintaining consistency with federal approach and increases the likelihood of cooperation (i.e., funding!) as the biobased industry develops. For example, the Georgia Industrial Technology Partnership followed this approach when it declared that “The levels of biopower, biofuels, and byproducts produced in Georgia will meet twenty (20) percent of the federal EE/RE biomass goals by the year 2020.” The Georgia Vision and Roadmap statement does not explain how they arrived the 20% figure and as we will see, this is important.

Adopting the same general approach, Table 2 uses the DOE biofuels goals and the EIA forecasts in an attempt to put the goal setting task into a Wisconsin perspective. It starts by stating the goals in terms of gallons of ethanol rather than quads. Then several different Wisconsin market shares are calculated for both the DOE and EIA figures. Finally, a recent production figure is provided for purposes of scale. For example, if Wisconsin captured 20% of the federal market share for biofuels, we would have produced 348.3 million gallons of ethanol in 2001. This is about 75% more than the production capacity we will have in place by 2006, counting plants currently in operation as well as those planned. Going forward, the federal market share goal rises very rapidly to 112.6 billion gallons in 2030. If Wisconsin is to maintain a 20% share of the DOE goals, production would have to increase to 22.5 billion gallons by 2030. This is approximately a 112 fold increase in capacity and would imply the construction of 562 ethanol plants equal in size to the ones already in production. The same calculation using the EIA forecasts results produces a 2030 production figure of 966.5 million gallons, implying only a fivefold increase in capacity. There is much work to be done to establish a numeric goal that Wisconsin can commit to, but this outlines the general process.

Of course, many variables can, and most likely will, change between now and then. Among them are the average plant size (which already appears to be increasing on a national scale), the development of additional ethanol feedstocks (some experts anticipate that by 2020 nearly two-thirds of U.S. ethanol production will be based on a non-corn feedstock), an expansion of alternative fuels beyond ethanol (biodiesel), as well as potential changes in the rate of expansion of the larger, fossil-fuel based motor fuel market (unless we see a marked change over the long term in American attitudes toward fuel efficiency). The point is that many factors impact the outlook for biobased products and ultimately, the margin of error in this process will be substantial. This will occur over the next several months.

Another option the Consortium may want to consider was used by Bioproducts Canada in establishing goals. In their case, they avoided the use of specific production figures and spoke only of increasing the production of alternative fuels and identified several steps they would take to accomplish that. Those steps would equate to the recommendations that the Wisconsin Consortium will ultimately make.

A further issue to be raised with the use of numeric production figures is that, while they are results focused and verifiable, they capture some values indirectly and fail to capture others at all. Production goals can be assumed to incorporate the environmental improvements achieved by displacing existing fossil fuels. The use of biobased feedstocks would displace an identifiable quantity of fossil fuels and the air emission improvement could be easily calculated from that. Likewise, strengthening the agriculture and forestry sections, while not addressed directly, can be assumed to result from the increased demand for raw materials from those sectors.

However, this goal structure fails to capture some aspects of the bioeconomy that many will find important in Wisconsin. There is no indication of the impact of biobased industry on water quality improvement. It is not completely clear that increased production of bioproducts will inevitably lead to improved water quality, even though many assume that to be the outcome. The Consortium may wish to establish a specific goal statement referring to this objective.

Nor does this approach capture the desire to concentrate on rural economic development, although an argument could be made that this too is a highly likely outcome. The Consortium may want to establish a specific rural economic development goal. For example, a goal could be set in terms of specific changes in the average wages or growth rates, gross regional product per employee, business investment or a variety of other measures of economic improvement.

Less assured, is the desire to retain local ownership and control. One could argue that the production goals may be met, but if success comes from large, national corporations, the value of retaining local ownership would be compromised. These goals also do not address the Governor's desire to become a leader in biobased industry. In this case, more difficulty may be experienced in establishing a quantifiable goal.

Meeting Objectives

So, what is the objective for the October 17th meeting? We need to acknowledge the values that the Consortium will follow as it crafts its recommendations. Is the enumerated list complete? We need to determine an acceptable way to establish Wisconsin production goals as a subset of the national goals. Critically, we need to know, in addition to production targets, what Wisconsin specific goals the Consortium deems important to measure and strive for. Alternatively, the Consortium could decide that economic production goals alone are sufficient. Once the Consortium determines additional, or substitute goals, staff can proceed to develop quantifiable statements for those goals. The group may also want to discuss the level of specificity they wish to apply to the goals. While any good goal should be subject to objective verification of its accomplishment, overly specific goals tend to be self-defeating as conditions change over time. This is particularly relevant as the biobased industry begins to play a more significant role in the American economy.

Ideally, by the conclusion of the October 17 discussion, the Consortium will have established the general outline of its goals and the format in which they will be stated. Specific goal statements will be crafted in the recommendations phase of the Consortium work.

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Table 2

Total US demand	Quads	87.8		115		130						
Total biomass demand	Quads	3.343		4.5		7.9						
Mkt Shr		3.81%		3.91%		6.08%						
GOALS		2001		2010		2020					2030	
Biofuels												
	% mkt. shr.	Quads	Gallons/yr	% mkt. shr.	Quads	Gallons/yr	% mkt. shr.	Quads	Gallons/yr	% mkt. shr.	Quads	Gallons/yr
U.S. DOE Goals	0.50%	0.1470	1,741,706,161	4%	1.3000	15,402,843,602	10%	4.0000	47,393,364,929	20%	9.5000	112,559,241,706
Wisconsin	20.00%	0.0294	348,341,232	20.00%	0.2600	3,080,568,720	20.00%	0.8000	9,478,672,986	20.00%	1.9000	22,511,848,341
Market Share	15.00%	0.0221	2,002	15.00%	0.1950	2,310,426,540	15.00%	0.6000	7,109,004,739	15.00%	1.4250	16,883,886,256
Examples	10.00%	0.0147	174,170,616	10.00%	0.1300	1,540,284,360	10.00%	0.4000	4,739,336,493	10.00%	0.9500	11,255,924,171
	5.00%	0.0074	87,085,308	5.00%	0.0650	770,142,180	5.00%	0.2000	2,369,668,246	5.00%	0.4750	5,627,962,085
	2.00%	0.0029	34,834,123	2.00%	0.0260	308,056,872	2.00%	0.0800	947,867,299	2.00%	0.1900	2,251,184,834
EIA Forecast			1,732,290,000			3,815,286,000			4,270,843,100			4,832,508,018
Wisconsin	20.00%		346,458,000	20.00%		763,057,200	20.00%		854,168,620	20.00%		966,501,604
Market Share	15.00%		259,843,500	15.00%		572,292,900	15.00%		640,626,465	15.00%		724,876,203
Examples	10.00%		173,229,000	10.00%		381,528,600	10.00%		427,084,310	10.00%		483,250,802
	5.00%		86,614,500	5.00%		190,764,300	5.00%		213,542,155	5.00%		241,625,401
	2.00%		34,645,800	2.00%		76,305,720	2.00%		85,416,862	2.00%		96,650,160
Actual Consumption			86,492,891									
Actual Prod 2006			200,000,000									
Biopower (elec)												
	% mkt. shr.	Quads	mWh/yr	% mkt. shr.	Quads	mWh/yr	% mkt. shr.	Quads	mWh/yr	% mkt. shr.	Quads	mWh/yr
U.S. DOE Goals		2.7	791,291,925	4%	3.3	967,134,575	5%	4	1,172,284,333	500%	5	1,465,355,417
EIA Forecast		1.9	556,835,058		2.31	676,994,203		2.63	770,776,949		3.02	885,074,672
Bioproducts												
	% mkt. shr.	Byn Lbs./yr		% mkt. shr.	Lbs./yr		% mkt. shr.	Lbs./yr		% mkt. shr.	Lbs./yr	
U.S. DOE Goals	5%		12.5	12%			18%			25%		
Wisconsin	10%		1.25	1.20%			1.80%			2.50%		

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